tion of rocks on his return to Lake Nyassa, which will give us a more detailed knowledge of that interesting volcanic and also coal-bearing region.

Naples, April 26 H. J. JOHNSTON-LAVIS

NOTES

TWO eminent chemists died on Monday, both born in the same year—1817—M. Karl Adolph Wurtz and Dr. R. Angus Smith, F.R.S. M. Wurtz, who was a pall-bearer at the funeral of Dumas, is stated to have died from the bursting of a blood-vessel; he was a candidate for the vacant post of Perpetual Secretary to the Academy of Sciences. Dr. Angus Smith had been in failing health for some time. A detailed account of the careers of both chemists we must postpone till next week.

THE Council of the Royal Geographical Society have selected the following travellers for honours:—Mr. A. R. Colquhoun, for his travels in China, and Dr. Julius von Haast, for his systematic exploration of the southern island of New Zealand, the Royal Medals; Mr. W. W. M'Nair, the Murchison Grant; Mr. Emil Boss, the Bach Grant; Mr. W. O. M'Ewan, the Cuthbert Peek Grant; and Dr. Haast, Dr. Max Buchner, and M. Ferdinand de Lesseps as honorary corresponding members.

GERMANY has been prompt in acknowledging the services of its Cholera Commission; by acclamation a bill was passed by Parliament on Tuesday awarding a sum of 135,000 marks to Dr. Koch and his companions.

THE Council of the British Association have resolved not to entertain any more applications for membership prior to the Montreal meeting, when members and associates will be elected as at any other meeting. The number of tickets applied for is 722.

DURING the discussion in the Dominion House of Commons upon the vote of 25,000 dollars to defray the expenses of the meeting in Montreal in August next of the British Association, some further arrangements for the reception of members were made known. The excursion to the Rocky Mountains will, it is announced, take place on September 4, the members being taken by the New Canadian Pacific Lake route, where specially-constructed steamers make direct connection with the railway on each side. The excursion will probably occupy two weeks, and arrangements have been made that members of the party may not be put to greater expense than one dollar and a half per diem during the trip. Of the 25,000 dollars granted by the Dominion Parliament, 5000 will be used to defray the expenses of the meeting itself, and a fund is being raised to guarantee the Association against loss in connection with the publication of their proceedings. In addition to the Rocky Mountains excursion, excursions will be arranged to Ottawa, Quebec, and probably to Belœil Mountain, a locality of great geological interest. Active preparations are being made at Montreal, Toronto, and other places which will be visited, to give the members a due reception. It has also been arranged by the Associated Atlantic Cable Company that social cable messages to and from the delegates and their friends shall be sent free of charge. This is regarded as a considerable contribution towards the success of the meeting in Montreal.

THE French Association for the Advancement of Science meets at Blois this year from September 4 to 11.

PROF. HUXLEY was examined on Tuesday before the Select Committee of the House of Commons on the Education, Science, and Art Departments. He stated that in his opinion greater attention should be paid in our public schools to physical science. The Endowed Schools Commission was appointed to a great extent on account of the general state of apathy which existed in connection with the endowed schools. There is a distinct provision that a certain proportion of marks should be given to science and modern languages. The system, however, is not well carried out in the public schools; not more than two hours a week are given to science. There is no doubt, Prof. Huxley stated, that the Oxford and Cambridge School Examination Board Regulations tend to handicap science extremely. The examiners found their examinations on what is taught in the schools, and the schools found their instruction on the requirements of the examiners. He regarded the present system of education as wrong from top to bottom. The subjects on which most stress is laid are really luxuries, while those which are regarded as luxuries are really the most essential. The present system of education in the country shuts out young men from many employments for which they should be eligible, and tends to the employment of foreigners. Prof. Huxley thought that an influential Minister, with a seat in the Cabinet, might do a great deal to improve education. It would be his business to judge in what direction the educational system was tending, and to enforce on the educational bodies a modification of their system in the desired direction. He would give the Minister power to insist upon more time being given to science and modern languages.

THE Royal Society *conversazione* on the 7th inst. was well attended, and the exhibits, mainly connected with physical science, interesting. Mr. J. Wimshurst exhibited the continuous electrophorus. This instrument consists of two glass disks, revolving in opposite directions upon the same axis. To the outer faces of the disks radial metallic sectors are attached, which in their turn are touched by brushes of fine wire. It is self-exciting under almost any condition of atmosphere, parts freely with its electricity, and the current will not change its direction while the instrument is at work. In Room II. was shown a map of the earthquake in Essex (April 22, 1884), with photographs of damaged buildings. In Room III. Messrs. Elliott Brothers showed some electrical and magnetic apparatus, including a simplex repeater board, Wheatstone's transmitter, Wheatstone's perforator (new form), portable electric lamps, worked by Skrivanow batteries, the Kew Committee magnetometer, and a selection of electrical and other instruments. In the principal library was a compound magnet, with bifilar suspension, showing the change in total moment produced by dividing a magnet into short lengths, exhibited by Mr. R. H. M. Bosanquet. The magnet consists of eighteen pieces of hard steel which, fitted end to end, form a cylindrical bar. These can be placed in the suspension tray either as a bar, or dispersed as separate pieces. When placed together as a bar the moment is between seven and eight times as great as when the pieces are separated. The equilibrium position of the suspended tray is east and west. When a magnet is placed in the tray a deflection takes place towards north and south. The tangent of this deflection measures the moment, according to the ordinary principles of bifilar suspension. Mr. Hilger exhibited various spectroscopes and a 6½-inch achromatic object glass in a mount of new construction. A new photometer and Dworak's sound radiometer, were sent by Mr. Preece; and Hughes' magnetic balance, and Prof. Minchin's absolute sine electrometer, by Mr. Groves. An interesting apparatus for the generation and distribution of ozonised air, to be placed in the Hôtel-Kursaal de la Maloja, Upper Engadine, was exhibited by Dr. A. Tucker Wise. To render the air as pure as possible in this building, ozone is added to the internal atmosphere in connection with the general plan of ventilation. By means of valves this ozonised air can be turned into any room at the rate of from 60 to 100 cubic metres per hour for each occupant. The Rev. S. J. Perry exhibited a selection from the series of drawings of the solar surface made at the Stonyhurst Observatory from 1880 to 1884.

AT the next meeting of the Society of Telegraph Engineers and Electricians, to be held on Thursday, May 22, at the Institu-

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tion of Civil Engineers, Mr. W. H. Preece, F.R.S., will give a review of the work done by the Electrical Congresses of Paris, and will describe the new units determined upon.

The Lord Lieutenant of Ireland has appointed the following Commissioners to inquire into the management of the Queen's Colleges and Royal University in Ireland :—R. P. Carton, Q.C., Mr. George Johnstone Stoney, F.R.S., Rev. Dr. Gerald Molloy, Rector of the Catholic University, Mr. Wm. Jack of Glasgow University, and Surgeon-General Marsten. Mr. N. D. Murphy, barrister, is appointed secretary.

The Engineering Department of the Yorkshire College at Leeds is about to be considerably enlarged, to admit of more students at the classes, and towards this object Sir Andrew Fairbairn, M.P., and Sir John Hawkshaw have each contributed 1000*l*.

The steamer *Alert*, one of the vessels to be engaged in the Greely Relief Expedition, sailed from New York on May 10.

The eminent Swedish astronomer, Prof. H. Gyldén, at present chief of the Stockholm Observatory, has been called to the Professorship of Practical Astronomy at Göttingen.

Herr Augustin Gamél of Copenhagen has offered to despatch the *Dijmphna*, under Lieut. Hovgaard, to Franz-Josef Land in the summer of 1885, provided the Danish Government will contribute part of the expenses. No contribution will be accepted from foreign nations.

Prof. Nordenskjöld has executed a detailed map of that part of the east coast of Greenland which he visited last summer, situated beyond Cape Dan, known from Lieut. Graah's journey. The peninsula on which the cape is situated he has named "King Christian's Island," and the harbour in which he landed "King Oscar's Harbour." Several other points have been named after celebrated Swedes and Danes.

The Finnish Senate has petitioned the Czar that all members of the forthcoming hydrographical expedition in the Baltic, which will cost about 100,000 marks, shall be Finnish subjects, as so little progress with such labours seems to be made under Russian naval officers.

The St. Petersburg Horticultural Exhibition and Botanical Congress, which was deferred last year owing to the coronation of the Czar, was opened on May 5. Mr. H. J. Elwes, F.L.S., of Preston House, Cirencester, was requested by the Science and Art Department to attend as the delegate on behalf of this country, and has been accredited.

Mr. J. E. Marr, M.A., Fellow of St. John's College, Cambridge, has been appointed by the Council to lecture in geology.

A violent shock of earthquake, having an undulatory character, was felt at Spoleto at 8 o'clock on Friday night. The bells were set ringing and the clocks stopped. On Saturday, at 9.50, a slight shock in the direction of from north-west to south-east was felt at Cosenza, and at Paola a somewhat stronger shock was felt.

The additions to the Zoological Society's Gardens during the past week include a Barbary Ape (*Macacus inuus* ♀) from North Africa, presented by the Countess of Craven; a Moufflon (*Ovis musimon* ♂) from Sardinia, presented by Col. Knox and the Officers of the 1st Battalion Scots Guards; a Common Raccoon (*Procyon lotor*, white variety) from North America, presented by Mr. F. J. Thompson; a Ground Hornbill (*Buceros abyssinicus*) from West Africa, presented by Capt. Rupert La T. Lonsdale; a Gold Pheasant (*Thaumalea picta* ♀) from China, presented by Mr. Frank Reed; two Peregrine Falcons (*Falco peregrinus*), European, presented by Lieut.-Col. Drummond Moray; two Alligators (*Alligator mississippiensis*) from the Mississippi, presented by Mrs. Andrade; a Green Tree Frog (*Hyla arborea*), European, presented by Mr. G. W. Obicini, F.Z.S.; twenty-one River Lampreys (*Petromyzon fluviatilis*) from British rivers, presented by Mr. T. E. Gunn; two Japanese Greenfinches (*Ligurinus sinicus* ♂ ♀) from Japan, two Common Crowned Pigeons (*Goura coronata*) from New Guinea, purchased; a Canadian Porcupine (*Erithizon dorsatus*), five Long-fronted Gerbilles (*Gerbillus longifrons*), two Variegated Sheldrakes (*Tadorna variegata*), bred in the Gardens.

OUR ASTRONOMICAL COLUMN

The Approaching Return of Olbers' Comet.—Now that the comet of Pons is drawing away from us, attention may be directed to another comet belonging to the same group as regards length of revolution, viz. that discovered by Olbers at Bremen on March 6, 1815, and last observed by Gauss at Göttingen on August 25. While it was still under observation an elliptic orbit was assigned by several astronomers, including Bessel and Gauss, who found the period between seventy and eighty years. Bessel subsequently discussed all the observations available to him, in a memoir published in the *Transactions of the Berlin Academy*, and, after determining the most probable orbit in 1815, he calculated the planetary perturbations to the time of ensuing return to perihelion, which he fixed to 1887, February 9, the effect of the perturbations being to accelerate the return by about 825 days.

An elaborate investigation of the elements of Olbers' comet and the effects of planetary attraction during the current revolution has been lately made by Herr F. K. Ginzel, of Vienna: it gained the prize of the Haarlem Society of Sciences, and was published by the Society in 1881. The author has availed himself of the improved values of the planetary masses and the other advantages which the astronomy of the last seventy years has placed in our hands, and has produced an interesting and skilfully-worked discussion of the motion of the comet since it passed out of view in 1815. He commences with a solar ephemeris, and coordinates X, Y, Z, founded upon Leverrier's Tables, and extending from March 4 to August 27, followed by an ephemeris from Bessel's ellipse of the comet's geocentric right ascension and declination and log. distance for the same period. In the next section the observations are as far as possible newly reduced, great care and trouble having been bestowed on the determination of the places of the comparison stars from the most reliable catalogues. It may be mentioned that there are observations at fourteen observatories, including Greenwich, where the comet was followed from May 22 to July 7; the series newly reduced are those of Berlin, Göttingen, Königsberg, Paris, Prague, and Seeberg. The necessary data for reduction of mean to apparent places of the comparison stars follow. The effect of parallax is applied to the comet's observed positions, and we have then the entire collection of deduced geocentric places, with the Berlin mean times of the observations.

In Bessel's investigation 187 observations were utilised; Ginzel has the greatly increased number of 346. The perturbations of Mercury, Venus, the Earth, Mars, Jupiter, Saturn, Uranus, and Neptune are next calculated for the period over which the observations extend; twelve normal positions are formed, and cleared of the effect of planetary attraction; then, in the usual manner, Bessel's elements are corrected by equations of condition, and the following definitive orbit for 1815 is obtained :—

Perihelion passage, 1815 April 26·030146 Berlin M.T.

	°	′	″	
Longitude of perihelion	149	2	2·8	M.Eq. 1815·0
,, ascending node	83	28	46·7	
Inclination...	44	29	50·8	
Eccentricity	0·93114958			
Log. perihelion distance	0·0837998			

Hence there results a revolution of nearly 74 years. The limits of uncertainty in this period are then examined, and found to be 75·68 and 72·33 years, and thus Ginzel concludes that the time of revolution given by the complete discussion of the observations of 1815 is in doubt to the extent of 1·6 year, or about a year and seven months.

In the next section of the memoir are presented the details of the laborious work involved in the calculation of the effect of planetary attraction during the actual revolution. The separate effect of each of the planets Jupiter, Saturn, Uranus, and Neptune

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